MARICOPA ASSOCIATION of GOVERNMENTS
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October 13, 1999

TO: Members of the MAG Telecommunications Advisory Group

FROM: Debbie Kohn, Avondale, Chairperson

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF AGENDA ADDENDUM

Thursday, October 14, 1999, 10:00 a.m.
MAG Office, Suite 200, Ocotillo Room
Telephonic Committee Meeting
302 North 1st Avenue, Phoenix

A meeting of the MAG Telecommunications Advisory Group (TAG) will be held at the time and place noted above. Members of the Telecommunications Advisory Group will attend **either in person or by telephone conference call.** Those attending by conference call who are local are requested to call 480-517-8900 between 9:55 a.m. and 10:00 a.m. To join the meeting press one, and after prompting, please enter the meeting ID number (6248) followed by the pound key, then press one and state your name. Those attending by conference call who are long distance (Gila Bend and Wickenburg MAG member agencies) are requested to call 1-800-729-1197, between 9:55 a.m. and 10:00 a.m. To join a meeting press eight, and after prompting, please enter the meeting ID number (6248) followed by the pound key, then press one and state your name. If you have a problem and require assistance, dial 0 after calling the number above.

The agenda was e-mailed and mailed on Monday October 11, 1999. The attachments to the tentative agenda, item # 2, are enclosed. Below is an item will be added to the tentative agenda, and is a factor to consider in evaluating projects submitted for federal funds for inclusion in the FY 2001-2005 Transportation Improvement Program (TIP). If you have any questions please contact Heidi Pahl at (602) 254-6300.

AGENDA ADDENDUM

A.	Emission Reduction Assessment of Proposed CMAQ Projects Based upon new Federal Highway Administration guidance, MAG staff has conducted an emission reduction assessment for proposed Congestion Mitigation Air Quality (CMAQ) projects submitted for the MAG FY 2001-2005 Transportation Improvement Program	A. For information and discussion.

(TIP). The Working Group will be asked to consider this information when reviewing projects submitted for inclusion in the TIP. It is anticipated that this information will be reviewed by the Air Quality Technical Advisory Committee and considered by the Transportation Review Committee when projects are selected for inclusion in the TIP. Please refer to the attached information.

October 6, 1999

TO: Members of the MAG Air Quality Technical Advisory Committee

FROM: Cari Anderson, Air Quality Senior Engineer

SUBJECT: EMISSION REDUCTION ASSESSMENT OF PROPOSED CMAQ PROJECTS

In accordance with new Federal Highway Administration (FHWA) guidance, MAG staff has conducted an emission reduction assessment for proposed Congestion Mitigation Air Quality (CMAQ) projects submitted for the MAG FY 2001-2005 Transportation Improvement Program (TIP). It is estimated that a total of $57 million in unprogrammed CMAQ funding is expected to be available for projects. The emission reduction and corresponding emission reduction per CMAQ dollar results of the projects analyzed in this assessment are provided in Attachment A. This information is being presented to the Air Quality Technical Advisory Committee for a possible recommendation to forward the analysis to the MAG Transportation Review Committee (TRC) for use in prioritizing projects for funding. Attachment A has been subdivided by mode (e.g., street projects, ITS projects, etc.) for the MAG modal committees. Projects not being forwarded to modal committees (e.g., trip reduction, rideshare, etc.) have been classified as "Air Quality" and are included in Attachment B. It is requested that the "Air Quality" projects be ranked by this committee and forwarded to the TRC for its November 2, 1999 meeting. It is anticipated that the TRC will receive recommendations from the MAG modal committees and prioritize proposed projects for funding.

BACKGROUND

Each year, MAG programs available federal funds. Jurisdictions are requested, via the Management Committee, the TRC, and modal technical advisory committees, to submit requests for federally funded projects. The proposed projects are entered into a database and processed through the MAG Congestion Management System (CMS) rating system. Depending on the data provided, the CMS generally allocates scores for congestion management, except in some instances where it is not feasible to provide sufficient information for the rating system. The individual projects are then grouped by mode and returned to the technical advisory committees with the scores provided, for prioritization. The resulting modal priorities are then presented to the TRC, together with an estimate of the funds available for recommendation for programming.

This year, FHWA released new guidance on the CMAQ program as reauthorized under TEA-21. This new guidance requires an assessment of expected emission reductions for proposed CMAQ projects. The guidance allows a qualitative assessment when quantitative analysis is not possible. The additional quantitative and qualitative

information will be considered by the modal committees and TRC in the prioritization process.
It is estimated that a total of $57 million in unprogrammed CMAQ funding is expected to be available for local projects. The deadline for submitting requests for MAG federal funding was September 24, 1999. A total of 185 potential CMAQ funded projects have been submitted to MAG, processed through CMS, and assessed for expected emission reductions. These projects will be reviewed and ranked by MAG modal technical advisory committees and will be considered by the TRC. The TRC will be requested to recommend a fiscally constrained list of projects for federal funding to the Management Committee for inclusion in the Draft FY 2001-2005 MAG TIP for an air quality conformity analysis.

TECHNICAL ANALYSIS

The guidance indicates that Metropolitan Planning Organizations (MPOs) need to develop procedures for assessing emission reduction benefits for proposed CMAQ projects. The draft methodology (see Attachment C) was reviewed by FHWA prior to the analysis. The new emission reduction assessment results will replace the Air Quality rating system that has been previously used in the prioritization process.

Portions of Maricopa County are designated as a Serious nonattainment area for Carbon Monoxide (CO), Ozone (O_3), and Particulate Matter (PM-10). Emission reduction benefits for all three pollutants were estimated using 2005 emission factors combined with the project transportation variable (e.g., VMT reduction) to yield a short-term benefit. The emission reduction benefits for the three pollutants were combined to yield a composite short-term emission reduction. The composite short-term emission reduction was combined with the life expectancy of the project to yield a long-term composite emission reduction. The emission reduction per CMAQ dollar was also calculated for proposed projects by dividing the long-term composite emission reduction by the requested CMAQ dollar figure.

The emission reduction and corresponding emission reduction per CMAQ dollar results are provided in Attachment A. The projects have been ranked by cost-effectiveness. Proposed projects that could not be quantified are also listed. It is important to note that almost all of the proposed projects support committed control measures contained in the MAG 1999 Serious Area Plans.

The new emission reduction benefit information will be considered in addition to the Congestion Management System (CMS) score. The CMS system was developed during the early 1990s and has been approved for use by the Regional Council. The scoring system uses average daily traffic counts as the predominant measures of congestion. Bonus points are awarded for projects that have a variety of congestion relief factors associated with them.

PROJECT OVERVIEW

As previously indicated, the proposed projects are grouped by mode and returned to the technical advisory committees, with the scores provided, for prioritization. The resulting modal priorities are then presented to the TRC, together with an estimate of the funds available for recommendation for programming. A brief overview is provided below:

Street Projects: The addition of through-lane capacity to a street is expressly prohibited under the CMAQ program. However, eligible projects that are considered by the Street Committee include the construction of left and right turn lanes at intersections and the paving of dirt roads. The MAG Streets Committee will review and recommend specific street projects.

Intelligent Transportation System (ITS) Projects: ITS projects are specifically listed in the federal guidance as being eligible for CMAQ funds. The MAG ITS Committee has already requested additional information for ITS projects to better judge their potential effectiveness, and will review and recommend specific ITS projects.

Transit Projects: Transit projects are also specifically listed in the federal guidance as being eligible for CMAQ funds. The Valley Metro Operating Staff (VMOS) and RPTA will review and recommend specific transit projects.

Bike and Pedestrian Projects: Similar to ITS and transit, bicycle and pedestrian facilities and programs are also specifically listed in the federal guidance as being eligible for CMAQ funds. Often, bicycle and pedestrian facilities submitted for consideration are combined in the form of multi-use paths. In this case, such projects are normally rated by both the MAG Regional Bicycle Task Force and the Pedestrian Working Group.

Telecommuting Projects: Telecommunication projects have been recognized as Transportation Demand Management measures. In accordance with Regional Council guidance, MAG currently has a substantial teleconferencing project underway to link all MAG jurisdictions and agencies. Additional projects have been submitted for consideration and will be reviewed and recommended by the MAG Telecommunications Advisory Group (MAGTAG). Some of the projects submitted will have the ability to benefit both Telecommunications and ITS projects and programs.

Air Quality Projects: There are some remaining projects that do not fall easily into a modal category. These projects, such as rideshare, travel or trip reduction and PM-10 efficient street sweepers, are regarded as having a general benefit to air quality. It is proposed that these projects be individually reviewed by the MAG Air Quality Technical Advisory Committee for recommendation.

The emission reduction and corresponding emission reduction per CMAQ dollar for proposed CMAQ projects for the MAG FY 2001-2005 TIP provided in Attachment A are being presented to the Air Quality Technical Advisory Committee for a possible recommendation to forward the analysis to the MAG Transportation Review Committee (TRC) for use in prioritizing projects for funding. It is requested that the "Air Quality" projects in Attachment B be ranked by this committee and forwarded to the TRC for its November 2, 1999 meeting. It is anticipated that the TRC will receive recommendations from the MAG modal committees and prioritize proposed projects for funding.

CMAQ Emission Reduction Assessment for Proposed CMAQ Projects

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
APJFED-02	Apache Junction	Mountain View Rd: Tepee St to McKellips Rd	Pave unpaved road	1.5	1026.0	1026.00	36.81	$50,000	$100,000	$150,000
APJFED-03	Apache Junction	Jacob Waltz Rd: Mountain View Rd to Nodak Rd	Pave unpaved road	0.5	205.2	410.40	36.66	$25,000	$50,000	$75,000
GDYFED-03	Goodyear	Rainbow Valley Rd: North past Patterson Rd	Pave dirt road	2	684.0	380.00	NS	$20,000	$180,000	$200,000
TMPFED-31	Tempe	Apache Blvd and Southern Ave: McClintock Dr to Priest Dr and Rio Salado Pkwy to Priest Dr	Construct communication conduit system	0	1003.2	371.56	NS	$30,000	$270,000	$300,000
MMAFED-01	Maricopa County	Phase 3 paving of dirt roadways in unincorporated Maricopa County	Phase 3 of the Maricopa County dirt road paving program	12	4104.0	227.29	NS	$1,805,640	$1,805,640	$3,611,280
MMAFED-02	Maricopa County	Phase 4 paving of dirt roadways in unincorporated Maricopa County	Phase 4 of the Maricopa County dirt road paving program	12	4104.0	227.29	NS	$1,805,640	$1,805,640	$3,611,280
MMAFED-03	Maricopa County	Phase 5 paving of dirt roadways in unincorporated Maricopa County	Phase 5 of the Maricopa County dirt road paving program	12	4104.0	227.29	NS	$1,805,640	$1,805,640	$3,611,280
CHNFED-20	Chandler	Arizona Ave: Chandler Blvd to Riggs Rd	Install fibre optic communication system (phase 3)	6	1641.6	209.39 ***	40.55	$22,000	$378,000	$400,000
GLNFED-03	Glendale	Union Hills Dr: 59th to 67th Aves and 67th Ave: Union Hills Dr to Deer Valley Rd	Install computerized signal system	3	369.6	96.78	42.85	$23,085	$381,915	$405,000
AVNFED-01	Avondale	126th Ave: Lower Buckeye Rd to Florence Ave	Pave dirt road, adding curb and gutter	0.5	342.0	93.70	NS	$25,000	$365,000	$390,000
AVNFED-02	Avondale	Elwood St: Vermeersch Rd to 127th Ave	Pave dirt road, adding curb and gutter	0.3	98.5	80.73	NS	$8,000	$122,000	$130,000
AVNFED-03	Avondale	Elwood St and Illini St: 124th Dr, 124th Ave and 123rd Dr (cul-de-sacs)	Pave dirt road, adding curb and gutter	0.3	98.5	80.73	NS	$8,000	$122,000	$130,000
GLNFED-02	Glendale	59th Ave: Mohawk Ln to Bell Rd	Install computerized signal system (hardware and software)	2	237.6	79.99	44.33	$17,955	$297,045	$315,000
AVNFED-04	Avondale	Illini St: Vermeersch Rd to El Mirage Rd	Pave dirt road, adding curb and gutter	1.1	361.2	73.70	NS	$30,000	$490,000	$520,000
AVNFED-05	Avondale	Bohne St: 127th Ave to 124th Ave (including Bohne Circle)	Pave dirt road, adding curb and gutter	0.5	164.2	72.96	NS	$15,000	$225,000	$240,000
PEOFED-01	Peoria	Citywide	Interconnect traffic signal system	0	633.6	67.19	NS	$57,000	$943,000	$1,000,000
AVNFED-06	Avondale	Florence Ave: 125th Ave to El Mirage Rd (including 123rd Circle)	Pave dirt road, adding curb and gutter	0.3	98.5	60.43	NS	$10,000	$163,000	$173,000
AVNFED-07	Avondale	Pioneer St: 127th Ave to El Mirage Rd	Pave dirt road, adding curb and gutter	0.5	164.2	59.69	NS	$17,000	$275,000	$292,000
AVNFED-10	Avondale	Las Ligas neighborhood (phase 1)	Construct sidewalks, adding curb and gutter	11.3	232.3	58.66	NS	$24,000	$396,000	$420,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
AVNFED-08	Avondale	County Line Rd: 127th Ave to 124th Ave	Pave dirt road, adding curb and gutter	0.3	98.5	43.97	NS	$14,000	$224,000	$238,000
TMPFED-27	Tempe	Pima St: Smith Rd to Industrial Dr and Perry Ln: Pima St to Rio Salado Pkwy	Pave dirt roads and construct new curb, gutter and sidewalk	0.6	410.4	40.35	29.25	$1,764,400	$1,017,200	$2,781,600
GLNFED-04	Glendale	Glendale Ave: 59th to 115th Aves	Install computerized signal system (including redundancy loop for Phoenix)	7	396.0	36.36	52.20	$65,835	$1,089,165	$1,155,000
MMAFED-06	Maricopa County	Bell Road: Grand Avenue to Loop 101	Real-time Traffic Coordination and Messaging System	6.5	264.0	34.06	40.60	$75,000	$775,000	$850,000
TMPFED-29	Tempe	Miller Rd: Curry Rd to Gilbert Dr	Pave dirt road and construct new curb, gutter and sidewalk	0.5	342.0	32.88	31.74	$1,382,000	$1,040,000	$2,422,000
TMPFED-28	Tempe	Perry Ln: University Dr to Rio Salado Pkwy	Pave dirt road and construct new curb, gutter and sidewalk	0.5	342.0	29.31	29.02	$835,000	$1,167,000	$2,002,000
SCTFED-06	Scottsdale	Scottsdale Rd: Pima Fwy to Indian School Rd	Install a smart traffic corridor	11	1056.0	26.88	56.46	$252,000	$3,928,000	$4,180,000
MESFED-03	Mesa	Power Rd: Thomas Rd to Baseline (excluding McKellips to Adobe but including Superstition Springs)	Install street smart signal system	8.5	448.8	24.26	52.29	$250,000	$1,850,000	$2,100,000
MESFED-02	Mesa	McKellips Rd: Gilbert Rd to Power Rd	Install smart street signal system	6	343.2	22.14	55.23	$250,000	$1,550,000	$1,800,000
TMPFED-30	Tempe	Apache Blvd and Southern Ave: Mill Ave to McClintock Dr	Expand Special Event and Parking Management System	0	316.8	19.56	NS	$180,000	$1,620,000	$1,800,000
MESFED-01	Mesa	Country Club Dr: 8th Ave to Baseline Rd (including US-60 TI)	Install real-time adaptive signal system	1.5	184.8	13.20	54.87	$300,000	$1,400,000	$1,700,000
RPTFED-06	RPTA	Regionwide	Purchase vanpool vans - 22 new and 50 replace	0	193.2	9.94	NS	$0	$1,944,000	$1,944,000
DOTFED-03	ADOT	7th St at I-10	Construct third westbound to southbound left turn lane	0.2	11.5	9.75	65.24	$7,125	$117,875	$125,000
DOTFED-07	ADOT	Pima Fwy: 90th St to Scottsdale Rd	Implement FMS	8.3	757.0	9.44	56.81	$484,500	$8,015,500	$8,500,000
DOTFED-09	ADOT	Price Fwy: Guadalupe Rd to Santan Fwy	Implement FMS	5.7	519.8	8.35	56.22	$376,200	$6,223,800	$6,600,000
DOTFED-08	ADOT	60: Gilbert Rd to Power Rd	Implement FMS	6	547.2	8.06	48.32	$410,400	$6,789,600	$7,200,000
RPTFED-07	RPTA	Regionwide	Purchase vanpool vans - 22 new and 78 replace	0	193.2	6.82	NS	$0	$2,835,000	$2,835,000
AVNFED-11	Avondale	Las Ligas neighborhood (phase 2)	Construct sidewalks	7.8	18.1	6.80	NS	$17,000	$266,000	$283,000
AVNFED-09	Avondale	Rio Vista neighborhood	Construct sidewalks	3.3	7.7	6.54	NS	$8,000	$117,000	$125,000
RPTFED-08	RPTA	Regionwide	Purchase vanpool vans - 22 new and 78 replace	0	193.2	6.49	NS	$0	$2,976,750	$2,976,750
DOTFED-02	ADOT	Union Hills Dr at Agua Fria Fwy	Construct northbound dual left turn lanes	0.2	5.0	3.55	49.74	$8,550	$141,500	$150,000
GDYFED-01	Goodyear	MC-85: Estrella Pkwy to Litchfield Rd	Add bike lane	2.3	5.3	2.12	37.89	$28,000	$252,000	$280,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
PHXFED-01	Phoenix	16th St at Northern Ave	Add turning lanes	0.4	9.7	2.06	51.53	$28,500	$471,500	$500,000
GDYFED-02	Goodyear	Bullard Ln: MC-85 to Buckeye Canal	Widen road for bike lane	2.1	4.9	1.55	37.87	$35,000	$315,000	$350,000
TMPFED-11	Tempe	Tempe Canal: UPRR to US-60	Design and construct multi-use path	2	4.6	1.55	NS	$200,000	$300,000	$500,000
CHNFED-02	Chandler	Western Canal: Dobson Rd to Pennington St	Construct paved multi-use path	0.5	1.2	1.48	NS	$5,000	$78,200	$83,200
SCTFED-04	Scottsdale	Cactus Rd at Hayden Rd	Add north and westbound left turn and eastbound right turn lanes	0.3	22.6	1.10	53.21	$155,000	$2,045,000	$2,200,000
DOTFED-04	ADOT	Cactus Rd at I-17	Construct westbound to northbound right turn lane and eastbound to southbound right turn lane	0.2	10.7	0.76	56.10	$85,500	$1,415,000	$1,500,000
DOTFED-01	ADOT	Greenway Rd at I-17	Construct westbound to northbound right turn lane and eastbound to southbound right turn lane	0.2	10.3	0.73	57.57	$85,500	$1,415,000	$1,500,500
TMPFED-22	Tempe	Apache Blvd: McClintock Dr to Price Rd	Design and construct bicycle and pedestrian crossing	0.1	0.2	0.66	40.82	$5,000	$35,000	$40,000
PEOFED-04	Peoria	Grand Ave at 83rd Ave and Peoria Ave	Design and construct at-grade pedestrian crossing, including pedestrian refuges adjacent to Grand Ave	2	4.6	0.65	49.18	$43,166	$714,123	$757,289
GILFED-03	Gilbert	Consolidated Canal: Warner Rd to Galveston St (Heritage Trail - Chandler Segment)	Design and construct multi-use path	1.5	3.5	0.63	38.78	$33,000	$550,000	$583,000
GILFED-04	Gilbert	Consolidated Canal: Baseline Rd to Guadalupe Rd (Heritage Trail - Mesa Segment)	Design and construct multi-use path	1.5	3.5	0.63	41.25	$33,000	$550,000	$583,000
GILFED-06	Gilbert	Eastern Canal: Olney Ave to Warner Rd	Design and construct multi-use path	1.5	3.5	0.63	36.29	$33,000	$550,000	$583,000
GILFED-07	Gilbert	Eastern Canal: Warner Rd to Galveston St	Design and construct multi-use path	1.5	3.5	0.63	35.04	$33,000	$550,000	$583,000
TMPFED-23	Tempe	Rio Salado Pkwy: 3rd St to Hardy Dr	Design and construct bicycle and pedestrian crossing	0.1	0.2	0.63	40.70	$5,000	$37,000	$42,000
CHNFED-01	Chandler	Dobson Rd: Frye Rd to Chandler Blvd	Narrow median to provide for bike lanes	0.5	1.2	0.62	52.43	$11,300	$185,600	$196,900
GILFED-05	Gilbert	Eastern Canal: Baseline Rd to Olney Ave	Design and construct multi-use path	1.5	3.5	0.58	37.54	$36,000	$600,000	$636,000
CHNFED-05	Chandler	Western Canal: Alma School Rd to Hamilton St	Construct multi-use path (phase 1)	1.5	3.5	0.55	51.23	$50,000	$633,000	$683,000
TMPFED-01	Tempe	Curry Rd: Scottsdale Rd to McClintock Dr	Design and construct pedestrian facilities	1	2.3	0.53	NS	$105,600	$438,200	$543,800
CHNFED-12	Chandler	Dobson Rd at Elliot Rd	Construct dual left turn lanes and auxiliary lanes in all directions	0.8	16.3	0.52	58.50	$1,396,100	$3,111,400	$4,507,500
CHNFED-06	Chandler	Western Canal: Price Rd to Alma School Rd	Construct multi-use path (phase 2)	1.8	4.2	0.50	54.19	$70,000	$836,000	$906,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
PVYFED-01	Paradise Valley	Tatum Boulevard at McDonald Drive	Re-align intersection	0.5	10.9	0.50	52.14	$550,000	$2,200,000	$2,750,000
MESFED-11	Mesa	US-60 (Superstition Fwy): Dobson Rd to Alma School Rd	Construct multi-use path in freeway ROW	1	2.3	0.49	55.34	$28,500	$471,500	$500,000
CHNFED-13	Chandler	Dobson Rd at Ray Rd	Construct dual left turn lanes, right turn lanes, and auxiliary lanes in all directions	0.8	12.3	0.46	51.75	$1,193,000	$2,667,000	$3,860,000
MESFED-08	Mesa	South Canal: Greenfield Rd to Granite Reef Dam	Construct multi-use path	3	7.0	0.41	50.35	$103,626	$1,714,374	$1,818,000
SCTFED-08	Scottsdale	Shea Blvd: 136th to 144th Sts	Design and construct multi-use path	1.2	2.8	0.39	49.95	$78,656	$707,902	$786,558
SCTFED-03	Scottsdale	Cactus Rd at Scottsdale Rd	Add south and northbound left turn lanes	0.2	6.3	0.36	47.38	$134,000	$1,770,000	$1,904,000
TMPFED-02	Tempe	El Paso Easement: Rural Rd to Kiwanis Pk	Design and construct multi-use path	0.5	1.2	0.33	50.21	$70,000	$350,000	$420,000
CHNFED-14	Chandler	Dobson Rd at Warner Rd	Construct dual left turn lanes and auxiliary lanes in all directions	0.8	9.4	0.32	56.04	$1,340,000	$2,917,000	$4,257,000
MESFED-05	Mesa	Gilbert Rd at US-60	Widen structure to construct dual left turn lanes north and southbound	0.2	5.6	0.30	51.56	$114,000	$1,886,000	$2,000,000
MAGFED-31	MAG	Regionwide	MAG telecomms project - operations (FY 2001)	0	9.0	0.29 **	NS	$0	$450,000	$450,000
PHXFED-06	Phoenix	Regionwide	Purchase bus: Standard - 19 replace	0	16.4	0.29	NS	$346,600	$5,733,400	$6,080,000
PHXFED-07	Phoenix	Regionwide	Purchase bus: Standard - 17 replace	0	14.7	0.29	NS	$310,100	$5,129,900	$5,440,000
TMPFED-04	Tempe	University Dr: Perry Lane to Price Rd	Design and construct pedestrian facilities	0.5	1.2	0.29	NS	$100,000	$400,000	$500,000
CHNFED-16	Chandler	Alma School Rd at Ray Rd	Construct dual left turn lanes and auxiliary lanes in all directions	0.8	8.3	0.28	55.43	$1,390,000	$2,947,000	$4,337,000
GLNFED-05	Glendale	55th Ave at Marshall Elementary School	Design and construct multi-use path across Thunderbird Park Diversion Channel	0.34	0.8	0.28	NS	$17,070	$282,406	$299,476
CHNFED-15	Chandler	Alma School Rd at Chandler Blvd	Construct dual left turn lanes and auxiliary lanes in all directions	0.8	7.7	0.26	58.55	$1,360,000	$2,987,000	$4,347,000
MESFED-10	Mesa	South Canal: McDowell Rd to Greenfield Rd	Construct multi-use path	2.5	5.8	0.25	47.54	$139,080	$2,300,920	$2,440,000
SCTFED-07	Scottsdale	Pima Rd: Via Linda to Inner Circle	Design and construct multi-use path and overpass	1.5	3.5	0.25	66.61	$300,000	$1,372,290	$1,672,290
TMPFED-08	Tempe	Rio Salado Pkwy (north bank): McClintock Dr to Rural Rd	Design and construct multi-use path	1.1	2.6	0.23	NS	$500,000	$1,100,000	$1,600,000
SCTFED-02	Scottsdale	McDowell Rd at Hayden Rd	Add south and eastbound right turn lanes	0.2	3.8	0.22	54.17	$144,000	$1,770,000	$1,914,000

TMPFED-19	Tempe	Western Canal: Price Rd to Kiwanis Park	Design and construct multi-use path	2.5	5.8	0.21	52.36	$250,000	$2,750,000	$3,000,000
Proj #	**Agency**	**Location**	**Work Type**	**Length(miles)**	**Emission Reduction**	**Emission Reduction per CMAQ $ ***	**CMS Score**	**Local Cost**	**Federal Cost**	**Total Cost**
CHNFED-17	Chandler	Dobson Rd at Chandler Blvd	Construct dual left turn lanes and auxiliary lanes in all directions	0.8	5.7	0.20	62.24	$1,290,000	$2,827,000	$4,117,000
SCTFED-01	Scottsdale	Mountain View Rd at 90th St	Add north and westbound left turn and eastbound right turn lanes	0.3	3.8	0.19	48.59	$156,000	$2,064,000	$2,220,000
MESFED-09	Mesa	South Canal: McKellips Rd to McDowell Rd	Construct multi-use path	1.5	3.5	0.16	53.06	$134,947	$2,232,553	$2,367,500
PHXFED-02	Phoenix	Cactus Rd at I-17	Add turning lanes	0.5	3.5	0.16	66.73	$131,100	$2,168,900	$2,300,000
TMPFED-35	Tempe	Creamery Railroad: University Dr to Rural Rd	Design and construct multi-use path	1	2.3	0.16	57.40	$112,000	$1,488,000	$1,600,000
MESFED-04	Mesa	Stapley Dr at US-60	Widen structure to construct dual left turn lanes north and southbound	0.2	5.5	0.15	53.10	$228,000	$3,772,000	$4,000,000
TMPFED-12	Tempe	Tempe Canal: University Dr to UPRR	Design and construct multi-use path	1	2.3	0.15	NS	$100,000	$1,500,000	$1,600,000
TMPFED-20	Tempe	US-60 (Superstition Fwy): Hardy Dr to College Ave	Design and construct multi-use path	1	2.3	0.15	61.95	$100,000	$1,500,000	$1,600,000
TMPFED-21	Tempe	Western Canal: I-10 to Elliot Rd	Design and construct multi-use path	3.25	7.5	0.15	53.06	$300,000	$4,900,000	$5,200,000
GDLFED-01	Guadalupe	Guadalupe Rd: Highline Canal to Calle Bella Vista	Upgrade arterial, adding frontage road, curb and gutter, bus pullouts and turn lanes	0.6	0.9	0.12	38.16	$50,000	$790,000	$840,000
MESFED-06	Mesa	Val Vista Dr at US-60	Widen structure to construct dual left turn lanes north and southbound	0.2	3.7	0.10	52.55	$228,000	$3,772,000	$4,000,000
PEOFED-03	Peoria	83rd Ave at Union Hills Dr	Reconstruct intersection and widen bridge to add a WB to NB right turn and an additional SB to EB left turn lane	0.5	1.4	0.10	56.23	$100,000	$1,400,000	$1,500,000
TMPFED-09	Tempe	Bonarden Rd at UPRR crossing	Design and construct multi-use path across at-grade RR crossing	0.25	0.6	0.10	40.56	$40,000	$560,000	$600,000
TMPFED-10	Tempe	Knox Rd at UPRR crossing	Design and construct multi-use path across at-grade RR crossing	0.25	0.6	0.10	36.19	$40,000	$560,000	$600,000
CHNFED-03	Chandler	Consolidated Canal at Germann and Riggs Rds	Multi-use crossing facilities	0.1	0.2	0.09	NS	$15,815	$250,000	$265,815
TMPFED-13	Tempe	UPRR Parallel Path at Price Fwy	Design and construct multi-use path and grade separated crossing	0.4	0.9	0.08	56.38	$70,000	$1,130,000	$1,200,000
TMPFED-14	Tempe	Balboa Dr at Price Fwy	Design and construct multi-use path and grade separated crossing	0.4	0.9	0.08	59.21	$70,000	$1,130,000	$1,200,000
TMPFED-15	Tempe	Country Club Way at US-60	Design and construct multi-use path and grade separated crossing	0.4	0.9	0.08	63.42	$70,000	$1,130,000	$1,200,000
TMPFED-16	Tempe	Dorsey Ln at US-60	Design and construct multi-use path and grade separated crossing	0.4	0.9	0.08	68.54	$70,000	$1,130,000	$1,200,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
TMPFED-17	Tempe	College Ave at US-60	Design and construct multi-use path and grade separated crossing	0.4	0.9	0.08	65.55	$70,000	$1,130,000	$1,200,000
GLNFED-06	Glendale	Bell Rd at Skunk Creek	Widen existing bridge for multi-use path	0.1	0.2	0.05	66.39	$25,650	$424,350	$450,000
LPKFED-01	Litchfield Park	Litchfield Rd Bypass at Wigwam Boulevard	Construct bicycle underpass	0.2	0.5	0.05	NS	$53,850	$886,420	$940,270
PHXFED-05	Phoenix	ACDC at 7th Ave	Construct bicycle underpass	0.2	0.5	0.04	63.11	$68,400	$1,131,600	$1,200,000
TMPFED-05	Tempe	Rio Salado Pkwy: East of Mill Avenue	Design and construct multi-use bridge and path across Rio Salado Parkway	0.2	0.5	0.04	NS	$500,000	$1,100,000	$1,600,000
TMPFED-06	Tempe	Hardy Dr at Rio Salado Pkwy	Design and construct multi-use bridge and path over Rio Salado lake west rubber dam	0.2	0.5	0.03	NS	$500,000	$1,500,000	$2,000,000
TMPFED-07	Tempe	Indian Bend Wash at Rio Salado Pkwy	Design and construct multi-use bridge and path over Rio Salado lake east rubber dam	0.2	0.5	0.03	NS	$500,000	$1,500,000	$2,000,000
MESFED-07	Mesa	Higley Rd at US-60	Widen structure to construct dual left turn lanes north and southbound	0.2	0.7	0.02	44.78	$171,000	$2,829,000	$3,000,000
PHXFED-03	Phoenix	51st Ave at the ACDC (joint project with Glendale)	Construct bicycle underpass	0.2	0.5	0.02	65.07	$114,000	$1,886,000	$2,000,000
TMPFED-26	Tempe	Rio Salado Pkwy at Tempe Beach Park	Design and construct bicycle and pedestrian crossing	0.1	0.2	0.02	33.99	$100,000	$1,500,000	$1,600,000
PHXFED-04	Phoenix	Grand Canal at I-17	Construct bicycle grade separation structure	0.2	0.5	0.01	62.20	$199,500	$3,300,500	$3,500,000
CHNFED-04	Chandler	Central Chandler Business District	Purchase and install twelve bicycle lockers	0	NQ	NQ	NS	$2,250	$36,000	$38,250
CHNFED-09	Chandler	Chandler Blvd: Arizona Ave to Dobson Rd	Design and construct bus pullouts	2	NQ	NQ	NS	$11,500	$183,000	$194,500
CHNFED-10	Chandler	Alma School Rd: Chandler Blvd to Summit Dr	Design and construct bus pullouts	2.5	NQ	NQ	NS	$11,500	$188,800	$200,300
CHNFED-11	Chandler	Arizona Ave: Chandler Blvd to Elliot Rd	Design and construct bus pullouts	2	NQ	NQ	NS	$12,000	$194,350	$206,350
CHNFED-18	Chandler	Arizona Ave: Elliot Rd to Chandler Blvd	Install fibre optic communication system (phase 2)	3	0.0	0.0 ***	53.01	$14,000	$236,000	$250,000
CHNFED-19	Chandler	Chandler Blvd at Arizona Ave and at Price Rd and Ray Rd at Price Rd	Install CCTV system (phase 1)	3	0.0	0.0 ***	46.39	$10,000	$170,000	$180,000
CHNFED-21	Chandler	Citywide	EMS/Traffic control integration study	0	NQ	NQ	NS	$4,400	$75,600	$80,000
CHNFED-22	Chandler	Chandler Traffic Control Center	Upgrade System Hardware/Software	0	NQ	NQ	NS	$44,000	$756,000	$800,000
DOTFED-06	ADOT	17: Peoria Ave to Greenway Rd	Construct auxiliary lanes	3	NQ	NQ	60.78	$114,000	$1,886,000	$2,000,000
DOTFED-10	ADOT	Valleywide	Freeway Service Patrols	0	NQ	NQ	NS	$0	$750,000	$750,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
GILFED-01	Gilbert	Gilbert Rd at UPRR	Construct Park and Ride lot (phase 1)	0	NQ	NQ	NS	$30,000	$500,000	$530,000
GILFED-02	Gilbert	Gilbert Rd at UPRR	Construct Park and Ride lot (phase 2)	0	NQ	NQ	NS	$24,000	$376,000	$400,000
GLNFED-01	Glendale	Citywide	Design, construct and operate Glendale Traffic Management Center	104	NQ	NQ	NS	$55,119	$911,881	$967,000
MAGFED-03	MAG	Regionwide	Contingency for air quality projects	0	NQ	NQ	NS	$0	$1,000,000	$1,000,000
MAGFED-04	MAG	Regionwide	Contingency for air quality projects	0	NQ	NQ	NS	$0	$1,000,000	$1,000,000
MAGFED-05	MAG	Regionwide	Advance design of programmed pedestrian and bicycle projects (FY 2001)	0	NQ	NQ	NS	$7,000	$100,000	$107,000
MAGFED-06	MAG	Regionwide	Advance design of programmed pedestrian and bicycle projects (FY 2002)	0	NQ	NQ	NS	$7,000	$100,000	$107,000
MAGFED-07	MAG	Regionwide	Advance design of programmed pedestrian and bicycle projects	0	NQ	NQ	NS	$2,000	$25,000	$27,000
MAGFED-08	MAG	Regionwide	Advance design of programmed pedestrian and bicycle projects	0	NQ	NQ	NS	$7,000	$100,000	$107,000
MAGFED-09	MAG	Regionwide	Advance design of programmed pedestrian and bicycle projects	0	NQ	NQ	NS	$7,000	$100,000	$107,000
MAGFED-10	MAG	Regionwide	Update MAG regional bicycle map (FY 2001)	0	NQ	NQ	NS	$3,000	$40,000	$43,000
MAGFED-11	MAG	Regionwide	Update MAG regional bicycle map (FY 2004)	0	NQ	NQ	NS	$3,000	$40,000	$43,000
MAGFED-12	MAG	Regionwide	Pedestrian design assistance (FY 2001)	0	NQ	NQ	NS	$8,000	$125,000	$133,000
MAGFED-13	MAG	Regionwide	Pedestrian design assistance (FY 2002)	0	NQ	NQ	NS	$8,000	$125,000	$133,000
MAGFED-14	MAG	Regionwide	Pedestrian design assistance	0	NQ	NQ	NS	$8,000	$125,000	$133,000
MAGFED-15	MAG	Regionwide	Pedestrian design assistance	0	NQ	NQ	NS	$8,000	$125,000	$133,000
MAGFED-16	MAG	Regionwide	Pedestrian design assistance	0	NQ	NQ	NS	$8,000	$125,000	$133,000
MAGFED-17	MAG	Regionwide	Regional rideshare program	0	NQ	NQ	NS	$0	$478,910	$478,910
MAGFED-18	MAG	Regionwide	Regional rideshare program	0	NQ	NQ	NS	$0	$502,855	$502,855
MAGFED-19	MAG	Regionwide	Enhanced rideshare marketing	0	NQ	NQ	NS	$0	$210,000	$210,000
MAGFED-20	MAG	Regionwide	Enhanced rideshare marketing	0	NQ	NQ	NS	$0	$220,500	$220,500
MAGFED-21	MAG	Regionwide	Enhanced rideshare marketing	0	NQ	NQ	NS	$0	$231,525	$231,525
MAGFED-22	MAG	Regionwide	Capitol rideshare program	0	NQ	NQ	NS	$0	$135,000	$135,000
MAGFED-23	MAG	Regionwide	Capitol rideshare program	0	NQ	NQ	NS	$0	$135,000	$135,000
MAGFED-24	MAG	Regionwide	Travel reduction program	0	NQ	NQ	NS	$0	$910,000	$910,000
MAGFED-25	MAG	Regionwide	Travel reduction program	0	NQ	NQ	NS	$0	$910,000	$910,000

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
MAGFED-27	MAG	Regionwide	Public telecommunications link study (FY 2001)	0	NQ	NQ	NS	$20,000	$300,000	$320,000
MAGFED-28	MAG	Regionwide	Public telecommunications link contingency	0	NQ	NQ	NS	$0	$2,000,000	$2,000,000
MAGFED-29	MAG	Regionwide	Public telecommunications link contingency	0	NQ	NQ	NS	$0	$2,000,000	$2,000,000
MAGFED-30	MAG	Regionwide	Public telecommunications link contingency	0	NQ	NQ	NS	$0	$2,000,000	$2,000,000
MAGFED-32	MAG	Regionwide	MAG telecomms project - operations (FY 2002)	0	0.0	0.0**	NS	$0	$450,000	$450,000
MAGFED-33	MAG	Regionwide	MAG telecomms project - training and marketing	0	0.0	0.0**	NS	$0	$200,000	$200,000
MAGFED-34	MAG	Regionwide	MAG telecomms project - training and marketing	0	0.0	0.0**	NS	$0	$200,000	$200,000
MAGFED-35	MAG	Regionwide	MAG telecomms project - training and marketing	0	0.0	0.0**	NS	$0	$200,000	$200,000
MAGFED-36	MAG	Regionwide	MAG telecomms project - outreach to underserved populations (Year 3 of 3)	0	0.0	0.0**	NS	$0	$250,000	$250,000
MAGFED-37	MAG	Regionwide	MAG telecomms project - additional teleconferencing sites (FY 2000)	0	0.0	0.0**	NS	$0	$496,000	$496,000
MAGFED-38	MAG	Regionwide	MAG telecomms project - additional teleconferencing sites	0	0.0	0.0**	NS	$0	$240,000	$240,000
MAGFED-39	MAG	Regionwide	MAG telecomms project - additional teleconferencing sites	0	0.0	0.0**	NS	$0	$300,000	$300,000
MAGFED-40	MAG	Regionwide	MAG telecomms project - additional teleconferencing sites	0	0.0	0.0**	NS	$0	$300,000	$300,000
MAGFED-41	MAG	Regionwide	MAG/RPTA Telework Outreach Program	0	NQ	NQ	NS	$0	$315,000	$315,000
MAGFED-42	MAG	Regionwide	MAG/RPTA Telework Outreach Program	0	NQ	NQ	NS	$0	$315,000	$315,000
MAGFED-43	MAG	Regionwide	MAG/RPTA Telework Outreach Program	0	NQ	NQ	NS	$0	$331,000	$331,000
MAGFED-44	MAG	Regionwide	MAG/RPTA telecommuting project - training and marketing	0	NQ	NQ	NS	$0	$300,000	$300,000
MAGFED-45	MAG	Regionwide	MAG/RPTA telecommuting project - training and marketing	0	NQ	NQ	NS	$0	$315,000	$315,000
MAGFED-46	MAG	Regionwide	MAG/RPTA telecommuting project - training and marketing	0	NQ	NQ	NS	$0	$331,000	$331,000
MAGFED-47	MAG	Regionwide	MAG/RPTA Ozone Outreach Program	0	NQ	NQ	NS	$0	$315,000	$315,000
MAGFED-48	MAG	Regionwide	MAG/RPTA Ozone Outreach Program	0	NQ	NQ	NS	$0	$330,750	$330,750

Proj #	Agency	Location	Work Type	Length(miles)	Emission Reduction	Emission Reduction per CMAQ $ *	CMS Score	Local Cost	Federal Cost	Total Cost
MAGFED-49	MAG	Regionwide	MAG/RPTA Ozone Outreach Program	0	NQ	NQ	NS	$0	$347,288	$347,288
MMAFED-04	Maricopa County	Countywide	Work Links Program	0	NQ	NQ	NS	$45,000	$750,000	$795,000
MMAFED-05	Maricopa County	Countywide	Work Links Program	0	NQ	NQ	NS	$45,000	$750,000	$795,000
RPTFED-01	RPTA	Regionwide	Regional Rail Development - Preliminary Engineering	0	NQ	NQ	NS	$210,700	$3,486,300	$3,697,000
SCTFED-05	Scottsdale	Bell Rd: 100th St to Thompson Peak Pkwy	New telecommuting and transit center	0	NQ	NQ	NS	$158,000	$2,459,000	$2,617,000
TMPFED-03	Tempe	McClintock Dr at Guadalupe Rd	Widen intersection	0.2	NQ	NQ	44.78	$100,000	$450,000	$550,000
TMPFED-18	Tempe	College Ave: Apache Blvd to US-60	Design and construction of bicycle and pedestrian facilities and traffic calming measures	2	NQ	NQ	NS	$200,000	$3,000,000	$3,200,000
TMPFED-32	Tempe	Tempe Transit Center	Construct traffic/transit operations center	0	NQ	NQ	NS	$50,000	$450,000	$500,000
TMPFED-33	Tempe	Citywide	Replace traffic signal control cabinets (phase 1)	0	NQ	NQ	NS	$500,000	$500,000	$1,000,000
TMPFED-34	Tempe	Citywide	Replace traffic signal control cabinets (phase 2)	0	NQ	NQ	NS	$500,000	$500,000	$1,000,000

* "Emission Reduction per CMAQ $" is calculated as the metric tons of benefit over the life of the project per $100,000 CMAQ funds.

* * All credit for the MAG telecomms project appears under the project MAGFED-31. These include the projects MAGFED-31 through MAGFED-40.

*** All credit for the ITS related projects CHNFED-18, CHNFED-19, and CHNFED-20 appear under the project CHNFED-20.

Measures whose emission reduction effect are not quantifiable are indicated by NQ in the "Emission Reduction" and "Emission Reduction per CMAQ $" columns.

Measures whose CMS score is not calculated are indicated by NS in the "CMS Score" column.

All projects support committed control measures in the MAG 1999 Serious Area Plans except those which are highlighted.

Emission reductions reflect the lifespan of the project.

PROPOSED METHODOLOGIES FOR MAG FY 2001-2005 TRANSPORTATION IMPROVEMENT PROGRAM (TIP) CONGESTION MANAGEMENT AND AIR QUALITY (CMAQ) PROJECTS

The carbon monoxide (CO), total organic gas (TOG), and particulate (PM-10) emissions reduction benefit will be estimated for proposed CMAQ projects to the extent possible. In accordance with FHWA guidance, a qualitative analysis will be prepared in cases where quantitative analyses are not possible. Many of the potential CMAQ projects are committed control measures in the MAG 1999 Serious Area CO and PM-10 Plans for the Maricopa County Nonattainment Area. It is important that the emissions reduction estimates for these committed measures be as consistent as possible with any emissions reduction credit contained in the Serious Area Plans.

The following narrative provides a proposed methodology for calculating emission reduction benefits for various types of CMAQ projects. Emission factors will be estimated for the year 2005 to provide a consistent basis for comparison of estimated emission reductions. Both a short-term benefit and long-term benefit will be estimated. The short-term benefit will equal the 2005 emission factor combined with the transportation variables described below. The short-term benefit for CO, TOG, and PM-10 will be combined to provide a composite emission reduction. The composite emission reduction will be multiplied by the life expectancy of the proposed project to provide a composite long-term benefit for the proposed project. The transportation variable needed for future analyses is noted below.

MOBILE5a and PART5 were run to estimate PM-10, CO, and TOG emissions for several measures in this analysis. All runs which required an average vehicle speed were run at a nominal speed of 30 miles per hour. All CO runs (winter scenario) were run at 50 degrees Fahrenheit in January. All TOG runs (summer scenario) were run at 90 degrees Fahrenheit in July. Temperature is not an input to PART5, which was used to estimate PM-10 factors. As a result, the composite emission factors which were developed and are used in this analysis are an amalgam of factors for different seasons and taken together do not reflect the annual average or any particular season, but reflect the summation of PM-10, CO, and TOG.

An estimate of the emission reduction per CMAQ dollar of those measures with a quantitative benefit will also be calculated. The reported emission reduction will be the long-term emission reduction of the project divided by the federal CMAQ funds that will be used for the project. The emission reduction will be reported as the metric ton per day reduction per 100,000 CMAQ dollars.

PEDESTRIAN/BICYCLE

PEDESTRIAN/BICYCLE PATHS

"Encouragement of Pedestrian Travel", "Encouragement of Bicycle Travel", and "Development of Bicycle Travel Facilities" are committed control measures in the MAG 1999 Serious Area CO and PM-10 Plans. A reduction in vehicles miles of travel (VMT) will be estimated assuming the replacement of vehicle trips with bicycle and pedestrian trips on the new facility. The methodology to be used in calculating emission reductions for a bicycle facility is described below.

The FHWA February 1995 Technical Report entitled "Transportation Control Measures Analyzed for the Washington Region's 15% Rate of Progress Plan" estimates that an additional 1,200 miles of bicycle paths would have the effect of reducing the work related VMT by 0.07 percent per day. The estimate is equivalent to a 0.00006 percent reduction for each mile of bicycle/pedestrian path. It is estimated that the total daily VMT in 2005 will be 79,016,700 vehicle-miles. Consequently, each additional mile of bicycle/pedestrian path is assumed to reduce the regional VMT by approximately 46 miles.

PART5 and MOBILE5a were run to estimate the average onroad emissions (PM-10, CO, and TOG) in the units of grams per mile. It was assumed that the average onroad emissions are approximately 10.5 grams per mile (1.0 grams TOG, 8.5 grams CO, and 0.9 grams PM-10) and the net reduction per mile of bicycle/pedestrian path is 483 grams per mile.

Miles of Pedestrian/Bicycle Facilities * 483 grams per day per path mile = RESULT (gram/day)

TRAFFIC FLOW IMPROVEMENTS

TRAFFIC SIGNAL COORDINATION

"Coordinate Traffic Signal Systems" is a committed control measure in the MAG 1999 Serious Area CO and PM-10 Plans. It is important that the emissions reduction estimate for this measure be consistent with the emissions reduction credit for "Coordinate Traffic Signal Systems" contained in the Serious Area Plans.

A reduction in vehicle hours of travel (VHT) will be estimated assuming that traffic signal coordination reduces vehicle idling time at intersections affected. The reduction in VHT will be multiplied by emissions factors for CO, TOG, and PM-10 to estimate emissions reduced per weekday in the year of project implementation. The methodology to be used in calculating emission reductions for a traffic signal coordination project is described below.

The amount of vehicle idling time per intersection saved with implementation of the measure will be estimated using data from the February, 1995 "Benefits of the Texas Traffic Light Synchronization (TLS) Grand Program II: Volume 1. Executive Summary and Appendices A-C". This study estimated that, on average, 16,366 hours of delay per intersection would be saved through enhanced traffic signal coordination. This annual benefit was calculated with the assumption that retiming primarily affects weekday time periods other than late at night. With approximately 260 weekdays per year, 16,366 hours of delay per year equates to approximately 62.9 hours of delay per weekday.

MOBILE5a and PART5 were run to estimate the average idle onroad emissions (PM-10, CO, and TOG) in the units of grams per hour. As recommended in the MOBILE5a Information Sheet #2, the idle emission factor is estimated by running the model at 2.5 miles per hour, and converting the resulting emission factor (in grams per mile) to grams per hour by multiplying by the factor of 2.5 miles per hour. The same methodology was used in PART5. The average onroad emissions are approximately 177.3 grams per hour at idle (19.2 grams TOG, 155.9 grams CO, and 2.2 grams PM-10) and the net reduction per synchronized intersection is 11 kg per intersection per day.

Number of synchronized lights * 11 kg/day * 1000 = RESULT (grams/day)

INTELLIGENT TRANSPORTATION SYSTEMS

"Develop Intelligent Transportation Systems" is a committed control measure in the MAG 1999 Serious Area CO and PM-10 Plans. It is important that the emissions reduction estimate for this measure be consistent with the emissions reduction credit for "Develop Intelligent Transportation Systems" contained in the Serious Area Plans.

The installation of Intelligent Transportation Systems (ITS) alerts drivers of congestion incidents, permitting efficient rerouting of traffic and increasing vehicle speeds; the increase in average vehicle speeds affects pollutant emissions. Emission factors will be calculated for vehicle operating speeds with and without the incident management and congestion mitigation provided by ITS. The estimated vehicle miles traveled on roadways impacted by incident management will be multiplied by the change in emission factors for CO, TOG, and PM-10 to estimate metric tons reduced per weekday in the year of project implementation. An example of the methodology to be used in calculating emission reductions for ITS is described below.

The Governor's Alternative Transportation System Task Force estimated that two congested miles per vehicle on arterials and two congested miles per vehicle on freeways could be avoided per congestion incident with the system. The net change in emission rates due to the increase in speeds will be combined with the Governor's Alternative Transportation System Task Force estimate of miles of congested travel avoided to estimate the impact of the ITS.

Rerouting of vehicles was estimated to increase average vehicle trip length by 0.6 miles on non-congested arterials. The emissions from the extra distance driven will be subtracted from the emission reduction estimated for the increased speed. The difference will be the overall change in per vehicle emissions.

The Governor's Alternative Transportation System Task Force estimated that the average congestion incident affects 9,960 vehicles and that each affected arterial has an average of 1.5 incidents per five weekdays. MOBILE5a and PART5 were run to estimate the onroad emissions in the units of grams per mile at the relevant vehicle speeds. Specifically, the speeds modeled reflected congested freeway speed (23.9 mph), uncongested freeway (33.3 mph), congested arterial (20 mph), and uncongested arterial (30.3 mph). It is assumed that each vehicle which is rerouted to avoid congestion emits a total of 12.8 grams less

than a vehicle which makes the shorter trip at lower speeds. Each arterial affected by ITS is assumed to reduce total onroad emissions by 38 kg per day.

Number of arterials affected * 38 kg/day * 1000 = RESULT (grams/day)

FREEWAY MANAGEMENT SYSTEM

The Freeway Management System (FMS) is an important element of the committed control measure, "Develop Intelligent Transportation Systems," in the MAG 1999 Serious Area CO and PM-10 Plans. It is important that the emissions reduction estimate for this measure be consistent with the emissions reduction credit for "Develop Intelligent Transportation Systems" contained in the Serious Area Plans.

The methodology developed by Sierra Research and described in the document *Feasibility and Cost Effectiveness of New Air Pollution Control Measures Pertaining to Mobile Sources* will be followed in modeling the addition of centerline miles of freeway into the freeway management system. The reduction in grams per mile will be multiplied by the miles of freeway added to the FMS to estimate CO, TOG, and PM-10 emissions reductions in metric tons per weekday in the year of project implementation. Since this measure affects emissions by increasing vehicle speeds, and exhaust and paved road PM-10 is not affected significantly by speed, it is assumed that PM-10 is not affected by this measure. Sierra Research estimated a reduction of 35.20 kg CO per mile and 2.84 kg TOG per mile in 2005. The net reduction assumed for this control measure is 38 kg per mile.

Number of miles of affected freeway * 38 kg/day * 1000 = RESULT (grams/day)

INTERSECTION IMPROVEMENTS

Intersection improvements include projects which add left turn and/or right turn lanes to improve traffic flow; these turn lanes reduce vehicle delay and idling emissions. The reduction in vehicle delay associated with addition of a second or third turn lane will be calculated by multiplying the existing vehicle queue length for that movement during the morning. (7-9 A.M.) and evening (4-6 P.M.) peak hours by a constant delay reduction factor. The reduction in delay due to adding a right or left turn lane where there is currently none (i.e. the adjacent lane accommodates both right and through or left and through movements) will be calculated by multiplying the existing queue length for the adjacent lane by the weighted average turning movement percent, and then applying the delay reduction factor. If one left or right turn lane is added, the delay reduction factor is 40 percent. If two lanes are added, the factor is 70 percent. The queue length and the turning movement percentages for each intersection will be derived from the 1998 MAG Congestion Study. If improvements are proposed for an intersection which is not included in the Congestion Study, the queue length and percentage turning movement will be estimated from data at a similar intersection, new field data collected at that intersection, or application of engineering judgment. The total reduction in vehicle delay at an intersection will be multiplied by a 2005 idling emission factor to determine the air quality benefit of each project.

MOBILE5a and PART5 were run to estimate the average idle onroad emissions (PM_{10}, CO, and TOG) in the units of grams per hour for 2005. As recommended in the MOBILE5a Information Sheet #2, the idle emission factor is estimated by running the model at 2.5 miles per hour, and converting the resulting emission factor (in grams per mile) to grams per hour by multiplying by the factor of 2.5 miles per hour. The same methodology was used in PART5. The average onroad emissions are approximately 177.3 grams per hour at idle (19.2 grams TOG, 155.9 grams CO, and 2.2 grams PM-10).

Number of hours of delay reduced at intersection * 177.3 grams/hour = RESULT (grams/day)

TRANSIT

ALTERNATIVE FUELS FOR BUSES

"Alternative Fuels for Fleets" is a committed control measure in the MAG 1999 Serious Area CO and PM-10 Plans.

MOBILE5a and PART5 were run to estimate the average emission rates for 1993 model year transit buses (categorized as heavy duty diesel vehicles in MOBILE5a and buses in PART5) in 2005. These emission factors were adjusted to reflect alternatively fueled buses using emission factors estimated in the U.S. Department of Energy National Alternative Fuel Hotline Heavy Duty Diesel Vehicle and Engine Resource Guide from October 1998. Table 1 in the DOE guide estimates certification standards for current generation buses (1996 EPA buses). Table 4 in the DOE guide includes certification standards for the only liquefied natural gas (LNG) engine type which fits in the current buses used in the area (DDC 50G). The average emission rates estimated by MOBILE5a and PART5 (in units of grams per mile) were reduced by the ratio of the certification standards (in units of grams per brake horsepower-hour) for the 1996 EPA buses and the buses with the LNG DDC 50G engine. The DOE certification standards were not used directly because the units of grams per mile were required for this analysis.

The buses using the LNG DDC 50G engine are assumed to emit approximately 2.0 grams per mile less of total emissions than the same bus conforming to the 1996 EPA standards. It is assumed that a transit bus travels 36,000 miles per year and operates 240 days per year, or 150 miles per working day. Each bus which is purchased with the LNG engine is assumed to reduce onroad emissions by 300 grams per day.

# of old buses replaced with natural gas buses * 300 grams/day = RESULT (grams/day)

INCREASED VANPOOL VANS

Vanpools reduce air pollution by decreasing the total VMT during work days by reducing the vehicle miles traveled in single occupancy vehicles (SOV) with vans. The Valley Metro 1997 Performance Management Analysis System (PMAS) Executive Summary indicates that 128 vans traveled 1,890,042 revenue miles

in 1997, or 14,773 miles per van. Valley Metro also estimates that the ridership is from seven to fifteen people per van. Assuming that the average ridership is eleven people, the 1.9 million van vehicle miles traveled replaces 20.8 million SOV miles traveled.

PART5 and MOBILE5a were run to estimate the average onroad emissions in the units of grams per mile. It was assumed that the average onroad emissions for SOVs are approximately 10.5 grams per mile. The same PART5 and MOBILE5a output files were examined for the equivalent emission rates for LDGT2s, the category which includes most full sized vans. It was assumed that the average onroad emissions for LDGT2s are approximately 16.3 grams per mile.

It was assumed that the emission reduction per van is the difference between the number of replaced SOV VMT at 10.5 grams per mile and the amount of annual van VMT at 16.3 grams per mile. The net benefit per van is estimated to be 1,466 kg per year or 6.1 kg per work day. The purchase of clean burning alternative fuel vans would result in greater benefit than that described above.

# of new vans * 6,100 grams/day = RESULT (grams/day)

OTHER SPECIFIC TRANSPORTATION CONTROL MEASURES

TELECONFERENCING PROGRAMS

"Encouragement of Telecommuting, Teleworking and Teleconferencing" is a committed control measure in the MAG 1999 Serious Area CO and PM-10 Plans.

Reductions in the number of vehicle trips and trip lengths associated with a telecommuting, teleworking or teleconferencing program will be estimated. PART5 and MOBILE5a were run to estimate the average onroad emissions in the units of grams per vehicle mile. It was assumed that the average onroad emissions are approximately 10.5 grams per vehicle mile and the net reduction due to this measure is 10.5 grams per vehicle mile multiplied by the reduction in total VMT.

VMT reduced per day from measure * 10.5 grams per vehicle mile = RESULT (grams/day)

OTHER PROJECTS

PAVING UNPAVED SHOULDERS/CURB AND GUTTER

Consistent with the Serious Area PM-10 Plan, it is assumed that the paving of each mile of unpaved shoulder results in a reduction of 8.42 pounds (3.8 kg) of PM-10 per day. No effect is assumed for CO or TOG.

Miles of paved shoulder/curb and gutter * 3800 grams per mile = RESULT (grams/day)

PAVING OF UNPAVED ROADS

Consistent with the Serious Area PM-10 Plan, it is assumed that the paving of each mile of unpaved road will reduce the fugitive dust by approximately 570 grams per mile, where the paved road fugitive dust rate is 1.573 grams per vehicle mile and the unpaved road fugitive dust rate is 573.91 grams per vehicle mile. This measure is not assumed to change the average vehicle speeds on the paved roads (20 miles per hour) and no effect is assumed for CO and TOG emissions.

VMT on newly paved roads * 570 grams per VMT = RESULT (grams/day)